Dynamic Changes of Properdin and Effects Of CHBP in Mouse Renal Ischemia Reperfusion Related Injury and Recovery Models

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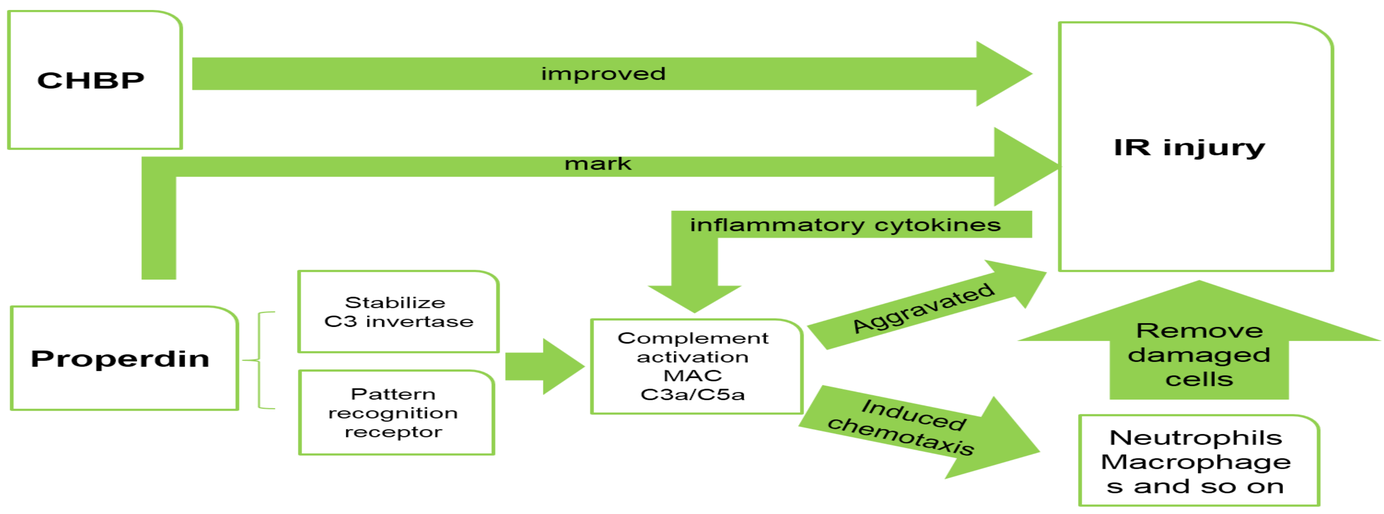
Background

Properdin, released predominantly from neutrophils, is an only known positive regulator of alternative pathway of complement activation via stabilizing C3bBb. Our pilot studies revealed that renal ischemia reperfusion injury (IRI) at 72 h was significantly aggregated by properdin deficiency in mice. We have also demonstrated a novel erythropoietin derivative, cyclic helix B peptide (CHBP), effectively improved renal IRI injury.

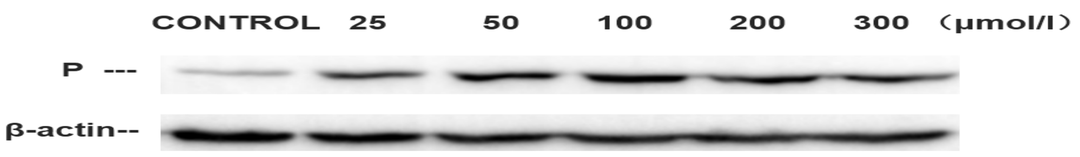


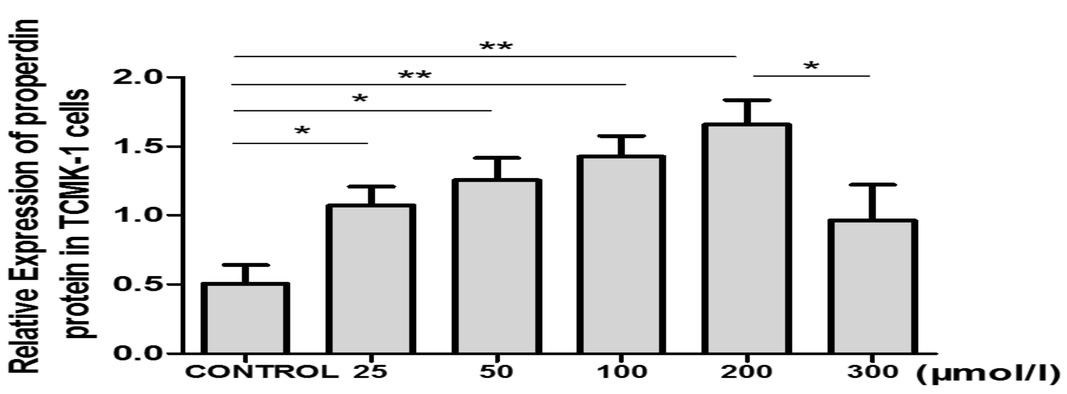
This study, therefore, aimed to further explore the dynamic changes of properdin, as well as the effect of CHBP in renal IRI and repair *in vivo* and *in vitro.*

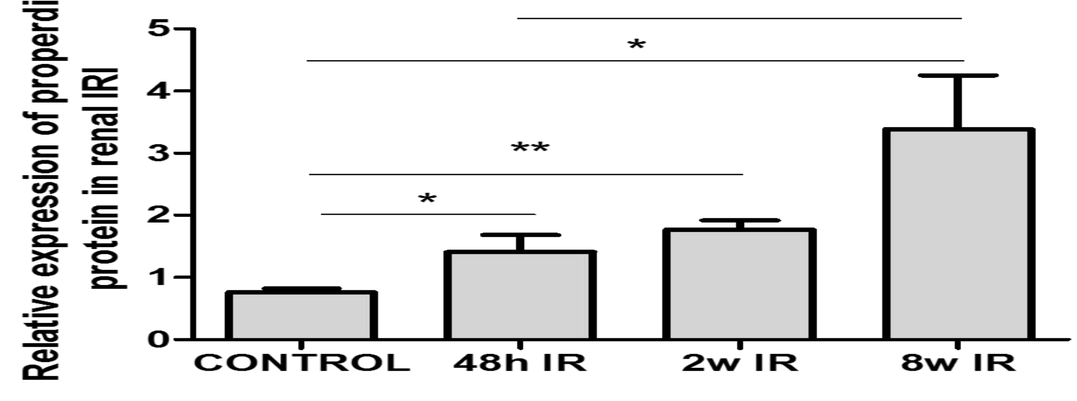
Methods

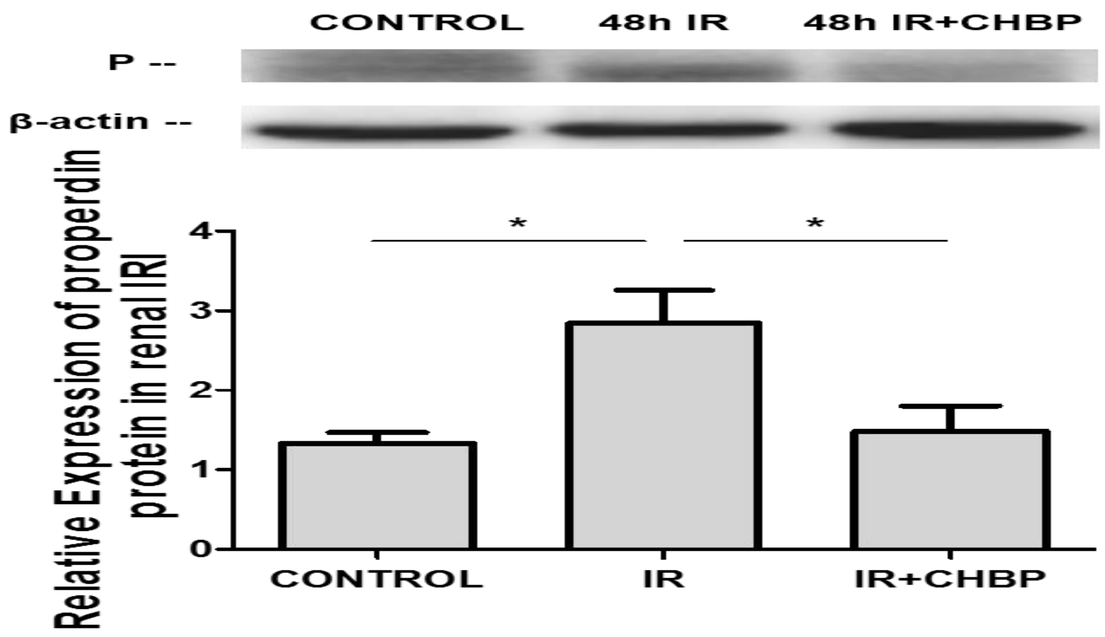
Mouse IRI was established in mouse renal epithelial cells (TCMK-1) *in vitro* via the stimulation of 0, 25, 50, 100, 200, 300μM H_2O_2 for 24 h, and mouse kidneys *in vivo* subjected to 30 min ischemia followed by 48 h, 2 and 8 week reperfusion. CHBP (24 nmol/kg) was injected intraperitoneally after reperfusion. The dynamic changes of properdin protein expression were analyzed by western blot.

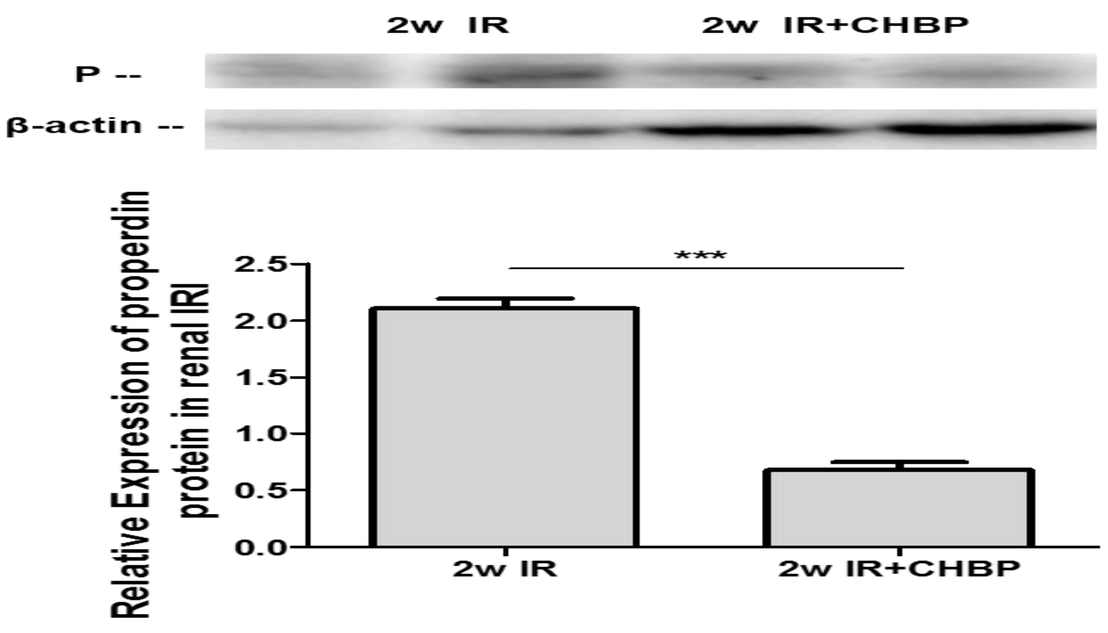
Results











Summary

In mouse TCMK-1 cells, the expression of properdin protein was increased in a dose-dependent manner and reached the peak at 200μM. In addition, in mouse IR kidneys, the properdin expression were also increased in a time-dependent manner and reached the peak at 8 weeks. Furthermore, the increasing properdin was reversed by CHBP treatment in mouse IR kidneys at 48 h and 2 weeks.

Conclusions

Properdin expression was dynamically increased by the raised dosage of H2O2 in vitro and prolonged reperfusion time in vivo. The increased properdin was reversed by CHBP treatment in mouse IRI kidneys at the early time points. Its underlying significance and mechanisms, especially whether enhanced properdin could be beneficial in injury repair/recovery, are worthy to be further investigated.

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